

# PATENT COOPERATION TREATY

# PCT


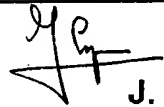
## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

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|--|---|--|
| Applicant's or agent's file reference<br><br><b>IPD/P1128/WOD</b>                                    | <div style="display: flex; justify-content: space-between;"> <span><b>FOR FURTHER ACTION</b></span> <span>See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)</span> </div> |  |
| International application No.<br><br><b>PCT/GB 95/ 00629</b>   | International filing date ( <i>day/month/year</i> )<br><br><b>22/03/1995</b>  | Priority date ( <i>day/month/year</i> )<br><br><b>23/03/1994</b> |
| International Patent Classification (IPC) or national classification and IPC<br><br><b>C12N15/53</b> |   |  |
| Applicant<br><br><b>THE SECRETARY OF STATE FOR DEFENCE et al.</b>                                    |   |  |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This **REPORT** consists of a total of 4 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consists of a total of \_\_\_\_\_ sheets.

3. This report contains indications and corresponding pages relating to the following items:
- I ☒ Basis of the report
  - II ☐ Priority
  - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV ☐ Lack of unity of invention
  - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI ☐ Certain documents cited
  - VII ☐ Certain defects in the international application
  - VIII ☒ Certain observations on the international application

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|--|--|
| Date of submission of the demand<br><br><b>23/10/1995</b>  | Date of completion of this report<br><br><b>12.07.96</b>   |
| Name and mailing address of the IPEA<br> European Patent Office, P.B. 5818 Patentaan 2<br>NL-2280 HV Rijswijk - Netherlands<br>Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,<br>Fax: (+31-70) 340-3016 | Authorized officer<br><br><b>J. Espen</b><br>Telephone No. <b>+31 70 340-2625</b> |

**I. Basis of the report**

1. This report has been drawn up on the basis of *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*

☒ the international application as originally filed

☐ the description, pages , as originally filed  
pages , filed with the demand  
pages , filed with the letter of

☐ the claims, Nos. , as originally filed  
Nos. , as amended under Article 19  
Nos. , filed with the demand  
Nos. , filed with the letter of

☐ the drawings, sheets / fig. , as originally filed  
sheets / fig. , filed with the demand  
sheets / fig. , filed with the letter of

2. The amendments have resulted in the cancellation of:

☐ the description, pages:  
☐ the claims, Nos.  
☐ the drawings, sheets / fig.

3. ☐ This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2 (c)).

4. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

|                          |        |            |     |
|--------------------------|--------|------------|-----|
| Novelty                  | Claims | 1-21,23-25 | YES |
|                          | Claims | 22         | NO  |
| Inventive Step           | Claims | 1-21,23-25 | YES |
|                          | Claims | 22         | NO  |
| Industrial Applicability | Claims | 1-25       | YES |
|                          | Claims |            | NO  |

**2. Citations and Explanations**

1). The present international application relates to a firefly luciferase variant having a glutamate replaced by an other amino acid. Said glutamate is found at residue 354 of *Photinus pyralis* luciferase or at residue 356 of *Luciola mingrelica*, *Luciola cruciata* and *Luciola lateralis*. Luciferases having such an amino acid substitution possess increased heat stability over wild type luciferases.

2). Document **D1** (EP-A-0 524 448) discloses a thermostable luciferase of a firefly, wherein an amino acid at the 217-position of the wild-type amino acid sequence is converted into a hydrophobic amino acid. After heating of said luciferase at 50°C for 60 min 65 to 70% of the residual enzyme activity is kept (D1, p. 13).

The features given in claim 22 of the present international application are not sufficient to distinguish the claimed luciferase from those described in D1.

In consequence, claim 22 does not meet the requirements of Art. 33 (2) PCT.

3). Having regard to the available prior art, the claimed subject-matter of claims 1-21, and 23-23 is novel (Art. 33 (2) PCT) and also involves an inventive step since it could not be deduced in an obvious manner from the prior art (Art. 33 (3) PCT).

D1 describes an amino acid substitution at residue 217 of a firefly luciferase, however an amino acid substitution at residue 354 (*Photinus*) or 356 (*Luciola*) is neither described nor suggested in this document.

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

In order to meet the requirements of Rule 6 PCT, the claimed matter should be defined by true technical and positive features.

Claims 1-4 do not meet this requirement, since the amino acid residue to be replaced is defined as being an amino acid other than glutamate.

The content of claims 5 and 6 would meet the requirements of Rule 6 PCT.